

REMARKS

The proposed amendments to Claims 1, 3, 4, 21, 22, 23, 26, 29 and 41 involve wording changes in regards to the alternative language and correction of some typographical errors and clarification in punctuation. The amendment to Claim 36 for the thickness is supported in the specification at page 14 line 34 through page 15 line 3.

Previously submitted claims 3, 4 and 29 were objected to because of the following informalities with use of the term "article stack" in the preamble for claims 3 and 4 and in claim 29 the insertion of the article "a".

Claims 3, 4 and 29 have been amended so that claims 3 and 4 are now directed to the coated article and claim 29 uses the article "a".

OBJECTIONS UNDER SECTION 112

Previously submitted claims 1-34, 36-38 and 40-45 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for use of alternative language different from that specified in MPEP 2173.05(h).

Claims 1, 22, 23, 26, 29 and 36 have been amended to utilize alternative language specified in MPEP 2173.05(h) including that at section II, a copy of which is enclosed herewith. Also, punctuation has been changed to clarify the alternative language. Both types of alternative language as noted in MPEP 2173.05(h) have been used to distinguish the sets of the alternatives from primary alternatives and secondary alternatives. It is respectfully submitted that with these amendments, the language of claims 1-34, 36-38 and 40-45 is clear and patentable.

Also, claim 41 was noted as being confusing for the use of alternative language and this claim has been amended to note that the protective layer is a dual layer selected from the materials noted in the alternative expressions.

REJECTIONS UNDER 35 U.S.C. 102 AND 103

Previously submitted claims 36, 38 and 40 were rejected under 35 U.S.C. 102(b) as being anticipated by the Finley et al. reference U.S. Patent 5,059,295.

The Office Action noted that Finley teaches the multiple layer coated article with layers in the following order beginning at the glass substrate: dielectric layer of mixed tin and zinc oxide, a layer of titanium, a layer of silver, another layer of titanium, and a layer of mixed tin and zinc oxide, and finally a layer of titanium oxide. It was noted in the Office Action the primer layers of titanium may be substituted with zirconium or chromium as noted in column 7, lines 16-20.

Claim 36 has been amended to have a film thickness when the protective layer is one of the specified metals. With this amendment to claim 36, claim 36 and claims 38 and 40, which are dependent claims of claim 36, are novel and patentable.

The '295 reference patent teaches at column 7 that the primer layer may be a titanium metal or other metal such as zirconium, chromium, and zinc/tin alloy. There is no teaching or suggestion that these metals can serve as a protective layer. This is what is claimed in claim 36, the protective layer in a specified thickness when the metal is the protective layer. A protective layer disclosed in the '295 patent is noted as being the titanium oxide or as noted at column 8, chemically resistant materials. Although there is no teaching or suggestion at the column 8 of what the protective coatings are and there is no teaching or suggestion of what their thickness might be.

Previously submitted claim 37 was rejected under 35 U.S.C. 103(a) as being unpatentable over the Finley '295 reference in view of the Arbab European Patent ("EP") document 0803481. It was noted in the Office Action that Arbab shows

Appln. No. 09/334,193

multiple dielectric and infrared reflective layers are well known in the art so that it would be obvious to one skilled in the art to provide Finley with the additional layer to provide an article with improved shelf life.

It is respectfully submitted that since claim 37 is dependent from claim 36, Claim 37 is unobvious and patentable because it depends from amended claim 36. The amendment provides a specific thickness for the protective layer when this layer is a metal. Therefore, when the protective layer is a metal in claim 37, it has a particular thickness as claimed in claim 36. The Finley '295 reference does not teach or suggest any specific thickness for the particular types of metal layers taught as primer layers rather than a protective layer. Therefore, incorporating the teaching of the Arbab EP patent document would not teach or suggest this deficiency. Therefore, it is respectfully submitted that claim 37 is unobvious and patentable.

Applicant's attorney notes that claims 1-34 and 42-45 would be allowable if rewritten in a form to overcome the rejection under 35 U.S.C. 112, second paragraph.

It is respectfully submitted that with the amendments for the claims regarding the 112 objection that these claims are now in condition for allowance.

Entry of this Rule 37 CFR 1.116 amendment is respectfully requested to place the application in condition for allowance and/or narrow the issues on appeal. If the Examiner is of the opinion that the application is not in condition for allowance, the Examiner is requested to apprise Applicants' attorney of the disposition of this amendment at the Examiner's earliest convenience.

Attached hereto is a marked-up version of the amendments to the claims made by the instant amendment. The

Appln. No. 09/334,193

attached page is captioned **"VERSION WITH MARKINGS TO SHOW
CHANGES MADE"**.

Respectively submitted,

KENNETH STACHEL, ESQ.
Registration No. 27,722
Attorney for Applicant

Kenneth J. Stachel
(412) 434-3186

Pittsburgh, Pennsylvania
August 22, 2002

RECEIVED

SEP 3 - 2002

TC 1700



VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Please amend without prejudice claims 1, 3, 4, 21, 22, 23, 26, 29, 36, and 41 in the below indicated manner.

1. (~~Twice~~ Thrice Amended) An infrared reflective coated article comprising:

a substrate;

a dielectric layer sputter deposited over the substrate, the layer comprising a first zinc stannate film deposited over the substrate having zinc in weight percent range of equal to and greater than 10 and equal to and less than 90, and tin in the weight percent range of equal to and less than 90 and equal to and greater than 10, and an electrical enhancing film deposited over the zinc stannate film, the electrical enhancing film selected from the group of films consisting of zinc oxide, tin oxide film and a second zinc stannate film wherein the composition of the first zinc stannate film is at least about 5 weight percent different than the composition of the second zinc stannate film, and

an infrared reflective layer deposited on the dielectric layer,

a metal primer layer over the infrared reflective layer;

a second dielectric layer over the primer layer; and

a protective layer of at least two films selected from the group consisting of metal-containing films, which are selected from different transition metals of Groups 4, 5, 6, or 10 of the Periodic Table of Elements; and silicon-containing films; and metal and silicon films; and films of metal and metal-oxy materials; and films of metal and silicon oxy-materials; and films of silicon and metal-oxy materials; and films of silicon and silicon oxy-materials; and films of metal oxy and silicon oxy materials; where the oxy materials are selected from the group consisting of oxides and oxynitrides, and wherein the protective layer is in a position where it can perform the protective function

for providing durability to the dielectric layer, infrared reflective layer, metal primer layer, and second dielectric layer.

3. (Amended) The coated article ~~stack~~ of claim 1 wherein the infrared reflective layer is a silver film and the silver film is deposited on the second zinc stannate film.

4. (Twice Amended) The coated article ~~stack~~ of claim 1 wherein the dielectric layer is a first dielectric layer and the infrared reflective layer is a first infrared reflective layer and further including:

a metal primer layer over the first infrared reflective layer;

a second dielectric layer over the primer layer and the protective layer is an overcoat over the second dielectric layer.

21. (Amended) The coating stack of claim 17 wherein the second zinc stannate film of the first dielectric layer is on the glass piece and has a thickness in the range of 230 ± 40 Angstroms Å; the first zinc stannate film of the first dielectric layer is on the second zinc stannate film of the first dielectric layer and has a thickness in the range of 80 ± 40 Å; the first infrared reflective metal layer is a first silver film deposited on the first zinc stannate film of the first dielectric layer and has a thickness in the range of 110 ± 30 Å, the metal primer layer is a titanium film deposited on the first silver layer and has a thickness in the range of 17-26 Å; the first dielectric film of the second dielectric layer is deposited on the titanium film and has a thickness in the range of 80 ± 40 Å; the first zinc stannate film of the second dielectric layer is deposited on the first dielectric film of the second dielectric layer and has a thickness in the range of 740 ± 40 Å; the second infrared reflective metal layer is a second silver film deposited on the second dielectric film of the second dielectric layer and has a thickness in the range of 110 ± 38 Å; the second

primer film is a titanium film deposited on the second silver layer and having a thickness in the range of 18 - 31Å; the first dielectric film of the third dielectric layer is deposited on the second titanium film and has a thickness in the range of $80 \pm 40\text{\AA}$; the first zinc stannate film layer of the third dielectric layer is deposited on the first dielectric film of the third dielectric layer and has a thickness in the range of $120 \pm 40\text{\AA}$, and the protective layer is a titanium metal film deposited on the first zinc stannate film layer of the third dielectric layer and has a thickness in the range of $29 \pm 3\text{\AA}$.

22. (Twice Amended) The coated article~~coating stack~~ of claim 1 wherein the protective layer has at least two films selected from the group consisting of a metal of titanium, zirconium, niobium, tantalum, chromium, nickel and or alloys thereof; and a metal oxy material of~~selected from~~ titanium oxides, titanium oxynitride, zirconium oxides, zirconium oxynitrides, niobium oxides, niobium oxynitrides, tantalum oxide, tantalum oxynitride, chromic oxides, chromic oxynitrides, nickel oxide, or nickel oxynitride; and silicon oxide; and silicon dioxide; and silicon aluminum nitride and combinations and mixtures of any two or more of these, where the first film of the layer is ~~selected from~~ the silicon, metal or and the metal oxy material.

23. (Thrice~~Twice~~ Amended) A coated article comprising:
a substrate;
a first dielectric layer over the substrate;
a first infrared reflective layer over the first dielectric layer;
a first metal primer layer over the first infrared reflective layer;
a second dielectric layer over the first metal primer, the second dielectric layer having a first dielectric film selected from the group consisting of zinc oxide, tin oxide film and a first

zinc stannate film, and a second dielectric film the second dielectric film having a composition different than the first dielectric film of the second dielectric layer;

a second infrared reflective layer over the second dielectric layer;

a second primer layer over the second reflective layer;

a third dielectric layer over the second metal primer layer; and

a protective layer of at least two films selected from the group consisting of metal-containing films, which are selected from different transition metals of Groups 4, 5, 6 or 10 of the Periodic Table of Elements; and silicon-containing films; and metal and silicon films; and films of metal and metal-oxy materials; and films of metal and silicon oxy-materials; and films of silicon and metal-oxy materials; and films of silicon and silicon oxy-materials; and films of metal oxy and silicon oxy materials, where the oxy materials are ~~selected from~~ or oxides or and oxynitrides and wherein the protective layer is in a position where it can perform the protective function for providing durability to the dielectric layers, infrared reflective layers, and metal primer layers.

26. (Thrice ~~Twice~~ Amended) A coated article comprising:

a substrate;

a first dielectric layer over the substrate;

a first infrared reflective layer over the first dielectric layer;

a first metal primer layer over the first infrared reflective layer;

a second dielectric layer over the first metal primer layer;

a second infrared reflective layer over the second dielectric layer;

a second metal primer layer over the second reflective metal layer;

a third dielectric layer having a first dielectric film selected from the group consisting of zinc oxide film; zinc oxide, tin oxide film; a first zinc stannate film and a second dielectric film overlying the first dielectric film, the second dielectric film having a composition different from the first dielectric film; and

the protective layer overlying the third dielectric layer where the protective layer is at least two films selected from the group consisting of: metal-containing films, which are ~~selected from~~ of different transition metals of Groups 4, 5, 6 or 10 of the Periodic Table of Elements; and silicon-containing films; and metal and silicon films; and films of metal and metal-oxy materials; and films of metal and silicon oxy-materials; and films of silicon and metal-oxy materials; and films of silicon and silicon oxy-materials; and films of metal oxy and silicon oxy materials; and where the oxy materials are ~~selected~~ from oxides or ~~and~~ oxynitrides.

29. (Thrice ~~Twice~~-Amended) A coated article comprising:

A substrate;

a first dielectric layer over the substrate;

a first infrared reflective layer over the first dielectric layer;

a first primer layer over the first reflective metal layer;

a second dielectric layer having a first dielectric film selected from the group consisting of a zinc oxide, tin oxide film and a first zinc stannate film, and a second dielectric film overlying the first dielectric film having a composition different than the first dielectric film of the second dielectric layer;

a second infrared reflective layer over the second dielectric layer;

a second primer layer over the second reflective layer;

a third dielectric layer over the second metal primer layer, the third dielectric layer having a first dielectric film selected from the group consisting of a zinc oxide, tin oxide film and a first zinc stannate film and a second dielectric film, the

second dielectric film of the third dielectric layer have a composition different than the composition of the second dielectric film of the third dielectric layer; and

the protective layer overlying the third dielectric layer where the protective layer is at least two films selected from the group consisting of: metal-containing and silicon-containing films, which are ~~selected from:~~ different metals, or metal and silicon, or metal and metal-oxy materials, or metal and silicon oxy-materials, or silicon and metal-oxy, or silicon and silicon oxy-materials, or metal oxy and silicon oxy materials, where the oxy materials are selected from the group consisting of oxides and oxynitrides and where the metal is selected from the group consisting of a transition metal of Groups 4, 5, 6 or 10 of the Periodic Table of Elements.

36. (Twice Amended) A coated article comprising:

a substrate;

at least one dielectric layer over the substrate;

at least one infrared reflective layer over the first dielectric layer;

optionally a first metal primer layer over the first infrared reflective layer;

optionally a second dielectric layer over a first metal primer; and

at least one protective layer selected from (A) a heat convertible metal film wherein the metal is selected from zirconium, niobium, tantalum, chromium, nickel and alloys thereof and alloys with silicon at a thickness for the layer of 15 to 25 Å, (B) at least two films selected from metal-containing and/or silicon-containing films selected from: metal and/or silicon and metal-oxy and or silicon oxy-materials where the oxy materials are selected from oxides and oxynitrides and where the metal is the same or different and selected from a transition metal of Groups 4, 5, 6 or 10 of the Periodic Table of Elements, wherein the protective layer

is located in the stack of layers to provide durability to the stack of layers.

41. (~~Thrice~~Twice Amended) A coated article of Claim 37 wherein the protective layer has at least two films selected from the groups consisting of metal and ~~or~~ silicon; or~~and~~ of metal oxy material and~~or~~ silicon oxy material and is located over ~~between~~ the second dielectric layer that is on the reflective layer and a third optional dielectric layer over the protective layer.